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LOCKHEED MARTIN

Via Federal Express
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WBS# 48720

October 16, 1998

Mr. Gerard J. Thibeault
Executive Officer
California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street, Suite 500
Riverside, California 92501-3339

**Subject:** **September 1998 Data Report**
**Water Supply Contingency Plan**
**Production Well Sampling Program**
**Crafton-Redlands Plume Project**

Dear Mr. Thibeault:

In compliance with the approved Water Supply Contingency Plan, enclosed please find one copy of the **September 1998, Production Well Sampling Program** report prepared by HSI-Geotrans for the Lockheed Martin Corporation. This report presents analytical results from samples collected at Bunker Hill Basin Production Wells in September of 1998. Laboratory Quality Assurance/Quality Control documentation is in Attachment C which is also enclosed for your review.

Should you have any questions, comments, or requests, please contact Tom Blackman at (818) 847-0791 or John Hemmans at (818) 847-0191.

Sincerely,

Carol Yuge
Director

Enclosures

cc: See Attached Distribution List

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HSI GEOTRANS
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October 21, 1998

Lockheed Martin Corporation
2550 N. Hollywood Way, 3rd Floor
Burbank, California 91505

Attention: Mr. John Hemmans
Project Coordinator

Subject: September 1998 Data Report
Water Supply Contingency Plan
Production Well Sampling Program
Crafton-Redlands Plume Project

Dear Mr. Hemmans:

This report presents a summary of field procedures, protocols, and results of the Water Supply Contingency Plan production well sampling for the month of September 1998. The Water Supply Contingency Plan (WSCP) was prepared by Lockheed Martin Corporation and submitted to the State of California Regional Water Quality Control Board (RWQCB) Santa Ana Region on September 30, 1996. The plan was conditionally approved by the RWQCB in a letter dated March 6, 1997. The WSCP for the Crafton-Redlands Plume was prepared to address maintenance of water supply to purveyors in the event those wells become impacted with trichloroethene (TCE) from the Crafton-Redlands TCE Plume.

The September 30, 1996 WSCP identified eight existing production wells in the eastern Bunker Hill Basin in the vicinity of the leading edge of the Crafton-Redlands Plume for monthly groundwater quality sampling. These eight production wells are operated by three local water purveyors/suppliers including the City of Loma Linda (COLL), Victoria Farms Mutual Water Company (Victoria Farms), and Southern California Edison (SCE). The wells identified for sampling include COLL Mountain View wells #1 and #2, COLL Richardson wells #1 and #2, Victoria Farms wells #1 and #3, and SCE wells #1 and #2.

In June 1997, Victoria Farms was connected to City of San Bernardino Water and Victoria Farms ceased pumping from both Victoria Farms wells #1 and #3. Thus,

WSCP sampling of Victoria Farms #1 and #3 ceased until such time as these wells become active. Due to sampling logistics, WSCP sampling of SCE #1 has been discontinued. Prior to August 1997, WSCP wells included COLL Mountain View wells #1 and #2, COLL Richardson wells #1 and #2, and the SCE #2 (AUX) well.

In August 1997, the WSCP was expanded due to the detection of perchlorate in certain municipal water supply wells in the Bunker Hill Basin. Twenty-six wells were added to the WSCP sampling program including 19 City of Riverside wells, five City of Redlands wells, and two Loma Linda University wells. The WSCP sampling program currently includes a total of 31 wells operated by five purveyors. In October 1997, three City of Riverside water system sampling points were added to the monthly WSCP sampling program, including the Waterman system pipeline (Iowa Booster), Gage system pipeline (Gage Delivery), and the sampling station measuring outflow from the Linden and Evans Reservoirs (7th & Chicago). In March 1998, two COLL water system sampling points were added to the monthly WSCP sampling program, including Mountain View system pipeline (Mountain View Blend at Lawton) and Richardson system pipeline (Richardson Blend). In June 1998, one additional City of Riverside water system sampling point and one additional COLL system sampling point were added to the monthly WSCP sampling (Gage Arlington and Mountain View Blend at Timoteo, respectively).

The locations of the 31 WSCP wells and analytical results for the September 1998 sampling event for TCE and perchlorate are shown on Figures 1 and 2, respectively. Table 1 presents a summary of analytical tests performed on each WSCP well and water system sampling point. The sampling frequency of each well is once a month for the first year. More frequent sampling, if required, is based on the analytical results as outlined in the WSCP TCE and perchlorate decision matrices, provided as Figures 3 and 4, respectively. The perchlorate decision matrix was presented in the *Perchlorate Work Plan and Schedule*, which was submitted, to the RWQCB on August 15, 1997. The RWQCB approved the Perchlorate Work Plan on October 31, 1997. Table 2 presents a summary of the wells sampled twice monthly according to the decision matrices.

## *FIELD METHODS*

HSI GeoTrans performed the September 1998 WSCP sampling program on September 8, 9, 10, 18, and 24, 1998. A summary of wells sampled and sample dates is outlined below and presented on Table 3.

The City of Riverside Gage wells were sampled on September 8 and 10, 1998. The City of Riverside water system sampling points (Iowa Booster, Gage Delivery, 7th & Chicago, and Gage Arlington) were sampled on September 9, 1998. The four COLL wells (Mountain View #1, Mountain View #2, Richardson #1, and Richardson #2) and the three COLL system sampling points (Mountain View Blend at Lawton,

Mountain View Blend at Timoteo, and Richardson Blend) were sampled on September 9, 1998. Four City of Redlands wells (COR Church Street, COR #38, COR Orange Street, and COR Rees), the SCE#2 (AUX) well, and one City of Riverside Waterman System well (Hunt #6) were sampled on September 10, 1998. The two Loma Linda University wells (Anderson #2 and #3) were sampled on September 18, 1998. The monthly samples collected from COLL Richardson #2 and the Richardson Blend system sampling point detected perchlorate at concentrations that triggered action per the perchlorate decision matrix. On September 24, 1998, confirmation samples were collected from COLL Richardson #1, COLL Richardson #2, and the Richardson Blend. Other WSCP wells (Gage 29-3, Hunt #10, Hunt #11, and COR Mentone Acres) were not sampled in September because the wells were off-line.

Mid-month WSCP sampling was conducted on September 18, 1998. Samples were collected from Gage 6 New, Gage 29-2, and Gage 92-1. A mid-month sample was not collected from COLL Mountain View #1 nor Gage 29-3 because the wells were off-line.

***Field Protocols***

Groundwater samples were collected in accordance with the State of California Regional Water Quality Control Board - Los Angeles Region (LARWQCB) Well Investigation Program (WIP) standards. In addition, HSI GeoTrans followed applicable components of the Quality Assurance Project Plan (QAPP) Addendum, Standard Operating Procedures (SOP) Addendum, and Health and Safety Plan (HASP) Addendum dated September 29, 1997 developed for Task 3 of the Redlands Groundwater Plume Project.

Prior to sampling and between wells, any field equipment that came into contact with groundwater was decontaminated. The decontamination procedure consists of washing equipment with non-phosphate detergent and potable water, followed by a potable water wash, and concluding with a deionized water rinse.

When possible, a static water level measurement was obtained at the time of sampling. During September, all wells that were sampled were pumping at the time of sampling. Turning off the pump to obtain a static water level measurement was not permitted. City of Loma Linda, City of Riverside, and City of Redlands (COR) water level data were collected by purveyor personnel and provided to HSI GeoTrans. According to purveyor personnel, water levels were allowed to recover a minimum of 30 minutes prior to collecting a static water level measurement. Water level data was not available from Loma Linda University or SCE.

Field parameters of pH, conductivity, temperature, and turbidity were measured during purging prior to sampling. A groundwater sample was collected when field

parameters were stable and a minimum of three casing volumes of groundwater had been removed. Wells were sampled using an existing low-flow valve on the discharge pipe.

Groundwater samples obtained for volatile organic compound (VOC) analysis and perchlorate were collected in three laboratory-supplied, certified-clean, 40-milliliter (ml) glass volatile organic analysis (VOA) vials for each analysis. All samples were labeled with the name of the sampler, time and date of collection, well designation, and required analysis, and placed in a cooler chilled to approximately 4 degrees Celsius using ice in a sealed bag. Samples were submitted under chain-of custody to Del Mar Analytical and analyzed for VOCs by EPA Method 502.2 per Level III and WIP quality assurance quality control (QA/QC) and perchlorate by EPA Method 300.0 modified. All field-collected data were recorded on the following GEOLIS forms; Water Level Form, Well Purging Form, and Water Sampling Form. Copies of the GEOLIS field forms are in Attachment A and available upon request. Other field-related data not recorded on the GEOLIS forms were recorded in a field notebook. Log entries in the field notebook were in accordance with WIP procedures.

## *RESULTS*

A summary of the analytical results for the September 1998 WSCP sampling event for TCE and perchlorate is shown on Figures 1 and 2, respectively and presented on Table 3. Available groundwater elevation data measured by purveyor personnel is provided on Table 4. Chain-of-custody and laboratory data sheets are in Attachment B and Level III QA/QC documentation is in Attachment C. Appendices A, B, and C are available upon request.

### *Trichloroethene*

Trichloroethene was detected at or above the detection limit of 0.5 $\mu$g/L in nine wells and four pipelines including; COLL Mountain View #1 (1.3 µg/L), COLL Richardson #2 (0.66 µg/L), Gage 6 New (2.6 µg/L), Gage 26-1 (7.5 µg/L), Gage 27-1 (3.9 µg/L), Gage 27-2 (1.8 µg/L), Gage 29-2 (4.6 µg/L), Gage 31-1 (0.59 µ g/L), Gage 92-1 (0.77 µg/L), the COLL Richardson Blend sampling point (0.56 µ g/L), the Gage Arlington sampling point (1.6 µg/L), the Gage Delivery sampling point (1.3 µg/L), and the 7$^{th}$ & Chicago sampling point (0.75 $\mu$g/L) as shown on Figure 1 and Table 3.

Groundwater samples collected from the remaining WSCP wells and system sampling points including; eight Gage wells (Gage 29-1, Gage 30-1, Gage 46-1, Gage 51-1, Gage 56-1, Gage 66-1, Gage 92-2, and Gage 92-3), two COLL wells (Mt. View #2 and Richardson #1), the SCE #2 (AUX) well, one City of Riverside water system sampling points (Iowa Booster), two City of Loma Linda sampling points (Mountain View Blend – Timoteo and Mountain View Blend – Lawton), and

one City of Redlands well (COR Rees) did not detect TCE. The trip blanks were also below the detection limit for TCE.

According to the TCE decision matrix (Figure 3), if a well meets or exceeds 2/5$^{th}$ of the MCL for TCE, and the TCE is a result of the Crafton-Redlands Plume, the well will be sampled on a twice-monthly basis. If a well meets or exceeds the MCL for TCE, and the TCE is a result of the Crafton-Redlands Plume, two confirmation samples will be collected within 48 hours and a temporary corrective action will be implemented. Four groundwater samples collected in September exceeded the MCL for TCE of 5.0 µg/L or 2/5$^{th}$ the MCL for TCE (2.0 µg/L). These wells are Gage 26-1 (7.5 µg/L), Gage 27-1 (3.9 µg/L), Gage 29-2 (4.6 µg/L), and Gage 6 New (2.6 µg/L). Based on the analytical history of these four wells and the current understanding of the location of the Crafton-Redlands Plume, the TCE impacts observed at Gage 26-1, Gage 27-1, and Gage 29-2 appear to be the result of the Norton AFB Plume and not the Crafton-Redlands Plume. Thus, more frequent groundwater sampling of Gage 26-1, Gage 27-1, and Gage 29-2 for TCE will not be implemented at this time. Based on the analytical history and well construction of Gage 6 New, the TCE impacts observed at Gage 6 New may be partially a result of the Crafton-Redlands Plume. Currently, this well is not used and only sampled for monitoring purposes. Thus, more frequent groundwater sampling of Gage 6 New for TCE will not be implemented at this time.

***Perchlorate***

The perchlorate decision matrix states that if perchlorate is detected in any well at or above the PAL of 18 µg/L for the first time, two confirmation samples should be collected within 48 hours of receipt of results. If perchlorate is detected in any well at or above 75 percent of the PAL of 18 µg/L (i.e. 13.5 µg/L) for the first time, a confirmation sample should be collected during the next regularly scheduled sampling event. If the result is confirmed, the well will then be sampled on a twice-monthly basis for three months. At the conclusion of three months (or six sampling events) the average perchlorate concentration will be calculated. If the average concentration of perchlorate is below 75 percent of the perchlorate PAL (i.e., 13.5 µg/L) the well will be sampled once a month. If the average perchlorate concentration is greater than 75 percent of the perchlorate PAL, then, the well will continue to be sampled on a twice-monthly basis for another three months. Currently, five wells are sampled on a twice-monthly basis for perchlorate (Gage 29-2, Gage 29-3, Gage 92-1, Gage 6 New, and COLL Mountain View #1) if the well is on line.

In September 1998, perchlorate was detected at or above the detection limit of 4 µg/L in three COLL wells (Mountain View #1, Mountain View #2, and Richardson #2) two COLL water system sampling points (Mountain View Blend at Lawton and the Richardson Blend), one City of Riverside Waterman System wells (Hunt #6), one

Loma Linda University well (LLU Anderson #2), eleven City of Riverside Gage wells (Gage 26-1, Gage 27-1, Gage 27-2, Gage 29-1, Gage 29-2, Gage 31-1, Gage 46-1, Gage 51-1, Gage 66-1, Gage 92-1, and Gage 6 New), and two City of Riverside water system sampling points (Gage Delivery and Gage Arlington), as presented on Figure 2 and Table 3.

In the September WSCP sampling perchlorate was detected at or above 75% (13.5 µg/L) of the PAL in four wells (COLL Mountain View #1, COLL Richardson #2, Gage 29-2, and Gage 6 New) and one COLL Water system sampling point (Richardson Blend). Most of these wells are currently being sampled on a twice-monthly basis when the wells are on line. Mountain View #1 was off-line during September.

The monthly samples from COLL Richardson #2 and the Richardson Blend detected perchlorate at levels that triggered action per the perchlorate decision matrix (16 µg/L and 24 µg/L, respectively). Confirmation samples were collected on September 24, 1998 from COLL Richardson #1, COLL Richardson #2 and the Richardson Blend and analyzed on a 24-hour rush turn around. Perchlorate results from the September 24, 1998 samples were lower for Richardson #2 (4.9 µg/L) and the Richardson Blend (Not Detected at 4 µg/L). The perchlorate levels were not confirmed to be above 75% of the perchlorate PAL thus, the COLL Richardson #2 and the Richardson Blend will not be sampled on a twice-monthly basis.

***Twice-Monthly Sampling Evaluation***

In accordance with the perchlorate decision matrix (Figure 4), if perchlorate is detected in any well at or above 75% (13.5 µg/L) of the PAL, and the concentration is confirmed, the well is to be sampled on a twice-monthly basis (if active) for a period of three months (six sampling events). If at the conclusion of the three-month sampling period, the average perchlorate concentration is greater than or equal to 75% of the PAL, then the well will continue to be sampled on a twice-monthly basis for the next three-month sampling cycle. If the average perchlorate concentration is less than 75% of the PAL, then the well will be sampled once a month.

The three-month twice-monthly sampling cycle concluded on September 30, 1998. During the past three months (July 1 through September 30, 1998) Gage 6 New was sampled six times. The average perchlorate concentration for Gage 6 New between July and September 1998 is 34.5 µg/L. Because Gage 6 New is no longer used for potable water use, this well will be sampled once a month for monitoring purposes. Average perchlorate concentrations for the wells sampled on a twice-monthly basis are presented on Table 5.

Six samples were collected from Gage 29-2 during the July 1 through September 30, 1998 three-month sampling cycle. The average perchlorate concentration for

samples collected from Gage 29-2 is 20.2 µg/L, thus Gage 29-2 will continue to be sampled on a twice-monthly basis.

Gage 29-3 was sampled four times during the three-month sampling cycle because the well was sometimes off-line. The average perchlorate concentration for samples collected from Gage 29-3 is 37.8 µg/L, thus Gage 29-3 will continue to be sampled on a twice-monthly basis.

The COLL Mountain View #1 well was sampled twice between July and September 1998. The average perchlorate concentration for COLL Mountain View #1 between July and September 1998 is 27.0 µg/L (Table 5). Because COLL Mountain View #1 is not in service at this time, this well will be sampled once a month for monitoring purpose, if possible.

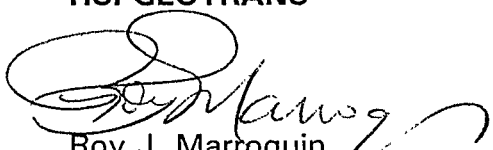
Gage 92-1 was sampled six times between July and September 1998. The average perchlorate concentration for the three-month period for Gage 92-1 is 10, which is less than 75% of the PAL (13.5 µg/L). Thus, according to the perchlorate decision matrix, Gage 92-1 will be sampled on a once a month basis.

***CLOSING***

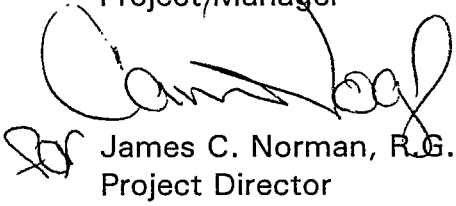
In October 1998, Lockheed Martin will continue to sample active WSCP wells in accordance to the WSCP sampling program. Twice monthly sampling for perchlorate will continue in September for wells Gage 29-2 and Gage 29-3, if active.

HSI GeoTrans greatly appreciates being of continued service to Lockheed Martin Corporation on this project. Should you have any questions or comments, please do not hesitate to call.

Sincerely,
**HSI GEOTRANS**



Roy J. Marroquin
Project Manager



James C. Norman, R.G., C.HG.
Project Director

# TABLES

## TABLE 1

## WSCP PRODUCTION WELL SAMPLING PROGRAM

| HSI# | Well Name | Perchlorate | TCE |
|---|---|---|---|
| City of Loma Linda | | | |
| 691 | Mountain View #1 | X | X |
| 692 | Mountain View #2 | X | X |
| 693 | Richardson #1 | X | X |
| 694 | Richardson #2 | X | X |
| City of Loma Linda Water System Sampling Points | | | |
| 2967 | Mountain View Blend - Lawton | X | X |
| 3016 | Mountain View - Timoteo | X | X |
| 2968 | Richardson Blend | X | X |
| Southern California Edison | | | |
| 554 | SCE#2(AUX) | X | X |
| Loma Linda University | | | |
| 267 | LLUniv Anderson #2 | X | |
| 717 | LLUniv Anderson #3 | X | |
| City of Riverside (Gage System) | | | |
| 252 | Gage#26-1 | X | X |
| 258 | Gage#27-1 | X | X |
| 259 | Gage#27-2 | X | X |
| 260 | Gage#29-1 | X | X |
| 219 | Gage#29-2 | X | X |
| 220 | Gage#29-3 | X | X |
| 218 | Gage#30-1 | X | X |
| 214 | Gage#31-1 | X | X |
| 215 | Gage#46-1 | X | X |
| 253 | Gage#51-1 | X | X |
| 216 | Gage#56-1 | X | X |
| 257 | Gage#66-1 | X | X |
| 644 | Gage#92-1 | X | X |
| 641 | Gage#92-2 | X | X |
| 642 | Gage#92-3 | X | X |
| 645 | Gage 6New | X | X |
| City of Riverside (Waterman System) | | | |
| 273 | Hunt#6 | X | |
| 271 | Hunt#10 | X | |
| 272 | Hunt#11 | X | |
| City of Riverside Water System Sampling Points | | | |
| 2946 | Iowa Booster (Waterman) | X | X |
| 2947 | Gage Delivery (Gage) | X | X |
| 2948 | 7th & Chicago (Reservoir) | X | X |
| 3018 | Gage Arlington | X | X |
| City of Redlands | | | |
| 542 | COR Church St | X | |
| 2673 | COR#38 | X | |
| 535 | COR Mentone Acres | X | |
| 29 | COR Orange st | X | |
| 74 | CORRees | X | X |

Notes:
TCE = Trichloroethene
Perchlorate analyzed using DHS Method (EPA 300.0 Modified)
TCE analyzed using EPA Method 502.2

**TABLE 2**

## WSCP PRODUCTION WELL SAMPLING PROGRAM
## SEPTEMBER 1998 WELLS SAMPLED TWICE MONTHLY

| HSI# | Well Name | Perchlorate | TCE |
|---|---|---|---|
| City of Loma Linda | | | |
| 691 | Mountain View #1 | X | |
| City of Riverside (Gage System) | | | |
| 219 | Gage #29-2 | X | |
| 220 | Gage #29-3 | X | |
| 644 | Gage #92-1 | X | |
| 645 | Gage 6 New | X | |

Notes:

TCE = Trichloroethene

Perchlorate analyzed using DHS Method (EPA 300.0 Modified).

TCE analyzed using EPA Method 502.2.

In September, Mountain View #1 and Gage 29-3 were not sampled mid-month because the well was off-line.

## TABLE 3
## WSCP PRODUCTION WELL SAMPLING PROGRAM
## SEPTEMBER 1998 DATA RESULTS

| HSI# | Well Name | Sample Date | Perchlorate (ppb) Del Mar | TCE (ppb) Del Mar |
|---|---|---|---|---|
| City of Loma Linda | | | | |
| 691 | Mountain View #1 | 9/9/98 | 28 | 1.3 |
| 691 | Mountain View #1* | NS | NS | NA |
| 692 | Mountain View #2 | 9/9/98 | 7.7 | ND(0.5) |
| 693 | Richardson #1 | 9/9/98 | ND(4) | ND(0.5) |
| 693 | Richardson #1 | 9/24/98 | ND(4) | NA |
| 694 | Richardson #2 | 9/9/98 | 16 | 0.66 |
| 694 | MUN-708 | 9/9/98 | 18 | 0.72 |
| 694 | Richardson #2 | 9/24/98 | 4.9 | NA |
| 694 | MUN-711 | 9/24/98 | 4.4 | NA |
| City of Loma Linda Water System Sampling Points | | | | |
| 2967 | Mountain View Blend-Lawton | 9/9/98 | 6.5 | ND(0.5) |
| 3016 | Mountain View Blend-Timoteo | 9/9/98 | ND(4) | ND(0.5) |
| 2968 | Richardson Blend | 9/9/98 | 24 | 0.56 |
| 2968 | Richardson Blend | 9/24/98 | ND(4) | NA |
| 2968 | MUN-712 | 9/24/98 | ND(4) | NA |
| Southern California Edison | | | | |
| 554 | SCE#2(AUX) | 9/10/98 | ND(4) | ND(0.5) |
| Loma Linda University | | | | |
| 267 | LLUniv Anderson #2 | 9/18/98 | 7.0 | NA |
| 717 | LLUniv Anderson #3 | 9/18/98 | ND(4) | NA |
| City of Riverside (Gage System) | | | | |
| 252 | Gage#26-1 | 9/8/98 | 9.9 | 7.5 |
| 258 | Gage#27-1 | 9/8/98 | 6.5 | 3.9 |
| 259 | Gage#27-2 | 9/8/98 | 7.9 | 1.8 |
| 260 | Gage#29-1 | 9/8/98 | 8.7 | ND(0.5) |
| 219 | Gage#29-2 | 9/8/98 | 19 | 4.6 |
| 219 | Gage 29-2* | 9/18/98 | 22 | NA |
| 220 | Gage#29-3 | NS | NS | NS |
| 220 | Gage#29-3* | NS | NS | NA |
| 218 | Gage#30-1 | 9/8/98 | ND(4) | ND(0.5) |
| 214 | Gage#31-1 | 9/8/98 | 4.6 | 0.59 |
| 215 | Gage#46-1 | 9/8/98 | 5.2 | ND(0.5) |
| 253 | Gage#51-1 | 9/8/98 | 12 | ND(0.5) |
| 216 | Gage#56-1 | 9/8/98 | ND(4) | ND(0.5) |
| 257 | Gage#66-1 | 9/8/98 | 10 | ND(0.5) |
| 644 | Gage#92-1 | 9/8/98 | 9.3 | 0.77 |
| 644 | MUN-707 | 9/8/98 | 9.2 | 0.67 |
| 644 | Gage#92-1* | 9/18/98 | 10 | NA |
| 641 | Gage#92-2 | 9/8/98 | ND(4) | ND(0.5) |
| 642 | Gage#92-3 | 9/8/98 | ND(4) | ND(0.5) |
| 645 | Gage 6 New | 9/10/98 | 35 | 2.6 |
| 645 | Gage 6 New* | 9/18/98 | 37 | NA |
| 645 | MUN-710 | 9/18/98 | 40 | NA |
| City of Riverside (Waterman System) | | | | |
| 273 | Hunt#6 | 9/10/98 | 6.3 | NA |
| 271 | Hunt#10 | NS | NS | NA |
| 272 | Hunt#11 | NS | NS | NA |
| City of Riverside Water System Sampling Points | | | | |
| 2946 | Iowa Booster (Waterman) | 9/9/98 | ND(4) | ND(0.5) |
| 2947 | Gage Delivery (Gage) | 9/9/98 | 7.0 | 1.3 |
| 2948 | 7th & Chicago (Reservoir) | 9/9/98 | ND(4) | 0.75 |
| 3018 | Gage Arlington | 9/9/98 | 6.0 | 1.6 |
| City of Redlands | | | | |
| 542 | COR Church St | 9/10/98 | ND(4) | NA |
| 2673 | COR#38 | 9/10/98 | ND(4) | NA |
| 535 | COR Mentone Acres | NS | NS | NA |
| 29 | COR Orange St | 9/10/98 | ND(4) | NA |
| 74 | COR Rees | 9/10/98 | ND(4) | ND(0.5) |
| 74 | MUN-709 | 9/10/98 | ND(4) | ND(0.5) |

Notes:

* = Twice-monthly sampling result
NA = Not analyzed for that compound
NS = Not sampled (Well off-line)
ND(4) = Not detected at the specified limit
MUN = Duplicate sample collected from the well listed directly above

TCE = Trichloroethene
DEL MAR = Del Mar Analytical Laboratory of Irvine, CA
Perchlorate analyzed using DHS Method (EPA 300.0 Modified)
TCE analyzed using EPA Method 502.2

## TABLE 4

## SUMMARY OF WATER LEVEL MEASUREMENTS
## SEPTEMBER 1998 SAMPLING EVENT

| HSI# | Well Name | Measure Date | Depth to Water | Measuring Point Elevation | Groundwater Elevation | Comments |
|---|---|---|---|---|---|---|
| CITY OF LOMA LINDA | | | | | | |
| 691 | Mountain View #1 | NM | NM | 1095 | NM | |
| 692 | Mountain View #2 | 08/31/98 | 170 | 1085 | 915 | Static |
| 693 | Richardson #1 | 08/31/98 | 155 | 1077 | 922 | Static |
| 694 | Richardson #2 | 08/31/98 | 145 | 1078 | 933 | Static |
| Southern California Edison | | | | | | |
| 554 | SCE#2(AUX) | NM | NM | 1100.00 | NM | |
| Loma Linda University | | | | | | |
| 267 | LLUniv Anderson #2 | NM | NM | 1075 | NM | |
| 717 | LLUniv Anderson #3 | NM | NM | 1070 | NM | |
| City of Riverside (Gage System) | | | | | | |
| 252 | Gage#26-1 | 09/01/98 | 98.0 | 1045.33 | 947.33 | Pumping |
| 258 | Gage#27-1 | 09/01/98 | 91.1 | 1044.64 | 953.54 | Pumping |
| 259 | Gage#27-2 | 09/01/98 | 99.6 | 1044.64 | 945.04 | Pumping |
| 260 | Gage#29-1 | 09/01/98 | 99.4 | 1044.43 | 945.03 | Pumping |
| 219 | Gage#29-2 | 09/01/98 | 106.1 | 1046.31 | 940.21 | Pumping |
| 220 | Gage#29-3 | 09/01/98 | 76.7 | 1048.75 | 972.05 | Static |
| 218 | Gage#30-1 | 09/01/98 | 171.3 | 1054.17 | 882.87 | Pumping |
| 214 | Gage#31-1 | 09/01/98 | 152.8 | 1054.64 | 901.84 | Pumping |
| 215 | Gage#46-1 | 09/01/98 | 124.0 | 1065.50 | 941.50 | Pumping |
| 253 | Gage#51-1 | 09/01/98 | 161.0 | 1044.64 | 883.64 | Pumping |
| 216 | Gage#56-1 | 09/01/98 | 170.9 | 1065.50 | 894.60 | Pumping |
| 257 | Gage#66-1 | 09/01/98 | 137.0 | 1044.85 | 907.85 | Pumping |
| 644 | Gage#92-1 | 09/01/98 | 165.5 | 1047.78 | 882.28 | Pumping |
| 641 | Gage#92-2 | 09/01/98 | 193.3 | 1053.38 | 860.08 | Pumping |
| 642 | Gage#92-3 | 09/01/98 | 183.9 | 1058.78 | 874.88 | Pumping |
| 645 | Gage 6 New | 09/01/98 | 107.0 | 1067.70 | 960.70 | Static |
| City of Riverside (Waterman System) | | | | | | |
| 273 | Hunt#6 | NM | NM | 1015.5 | NM | |
| 271 | Hunt#10 | NM | NM | 1017 | NM | |
| 272 | Hunt#11 | NM | NM | 1015.7 | NM | |
| City of Redlands | | | | | | |
| 542 | COR Church St | Sep-98 | 102.0 | 1344.8 | 1242.80 | Static |
| 2673 | COR#38 | Sep-98 | 99.0 | NA | NA | Pumping |
| 535 | COR Mentone Acres | Sep-98 | 148.0 | 1506.4 | 1358.40 | Static |
| 29 | COR Orange st | Sep-98 | 142.5 | 1282 | 1139.50 | Pumping |
| 74 | COR Rees | Sep-98 | 206.0 | 1490 | 1284.00 | Pumping |

Notes:

All measurements reported in feet below measuring point (ft-bmp)

Water level measurements for all City of Loma Linda, City of Riverside, and City of Redlands wells were obtained by purveyor personnel.

Elevations given in feet above mean sea level (ft-msl)

NM=Not measured

NA=Data not available

Static water levels were allowed to recover a minimum of 30 minutes to obtain a static water level measurement

## Table 5

### Twice Monthly Sampling Program
### Three Month Data and Average
### Perchlorate Concentrations

| Well Name | Sample Date | Sample Result | 75% of PAL | PAL |
|---|---|---|---|---|
| Gage 6 New | 7/6/98 | 35 | 13.5 | 18 |
| Gage 6 New | 7/15/98 | 31 | 13.5 | 18 |
| Gage 6 New | 8/5/98 | 33 | 13.5 | 18 |
| Gage 6 New | 8/18/98 | 36 | 13.5 | 18 |
| Gage 6 New | 9/10/98 | 35 | 13.5 | 18 |
| Gage 6 New | 9/18/98 | 37 | 13.5 | 18 |
| **Average 4/1/98 - 6/30/98** | | **34.5** | | |
| Gage29-2 | 7/6/98 | 21 | 13.5 | 18 |
| Gage29-2 | 7/15/98 | 20 | 13.5 | 18 |
| Gage29-2 | 8/3/98 | 18 | 13.5 | 18 |
| Gage29-2 | 8/18/98 | 21 | 13.5 | 18 |
| Gage29-2 | 9/8/98 | 19 | 13.5 | 18 |
| Gage29-2 | 9/18/98 | 22 | 13.5 | 18 |
| **Average 4/1/98 - 6/30/98** | | **20.2** | | |
| Gage29-3 | 7/1/98 | 44 | 13.5 | 18 |
| Gage29-3 | 7/15/98 | 36 | 13.5 | 18 |
| Gage29-3 | 8/3/98 | 34 | 13.5 | 18 |
| Gage29-3 | 8/18/98 | 37 | 13.5 | 18 |
| **Average 4/1/98 - 6/30/98*** | | **37.8** | | |
| Gage92-1 | 7/1/98 | 10 | 13.5 | 18 |
| Gage92-1 | 7/15/98 | 9.7 | 13.5 | 18 |
| Gage92-1 | 8/3/98 | 9.7 | 13.5 | 18 |
| Gage92-1 | 8/18/98 | 11 | 13.5 | 18 |
| Gage92-1 | 9/8/98 | 9.3 | 13.5 | 18 |
| Gage92-1 | 9/18/98 | 10 | 13.5 | 18 |
| **Average 4/1/98 - 6/30/98** | | **10.0** | | |
| COLLMt.View#1 | 8/4/98 | 26 | 13.5 | 18 |
| COLLMt.View#1 | 9/9/98 | 28 | 13.5 | 18 |
| **Average 4/1/98 - 6/30/98*** | | **27.0** | | |

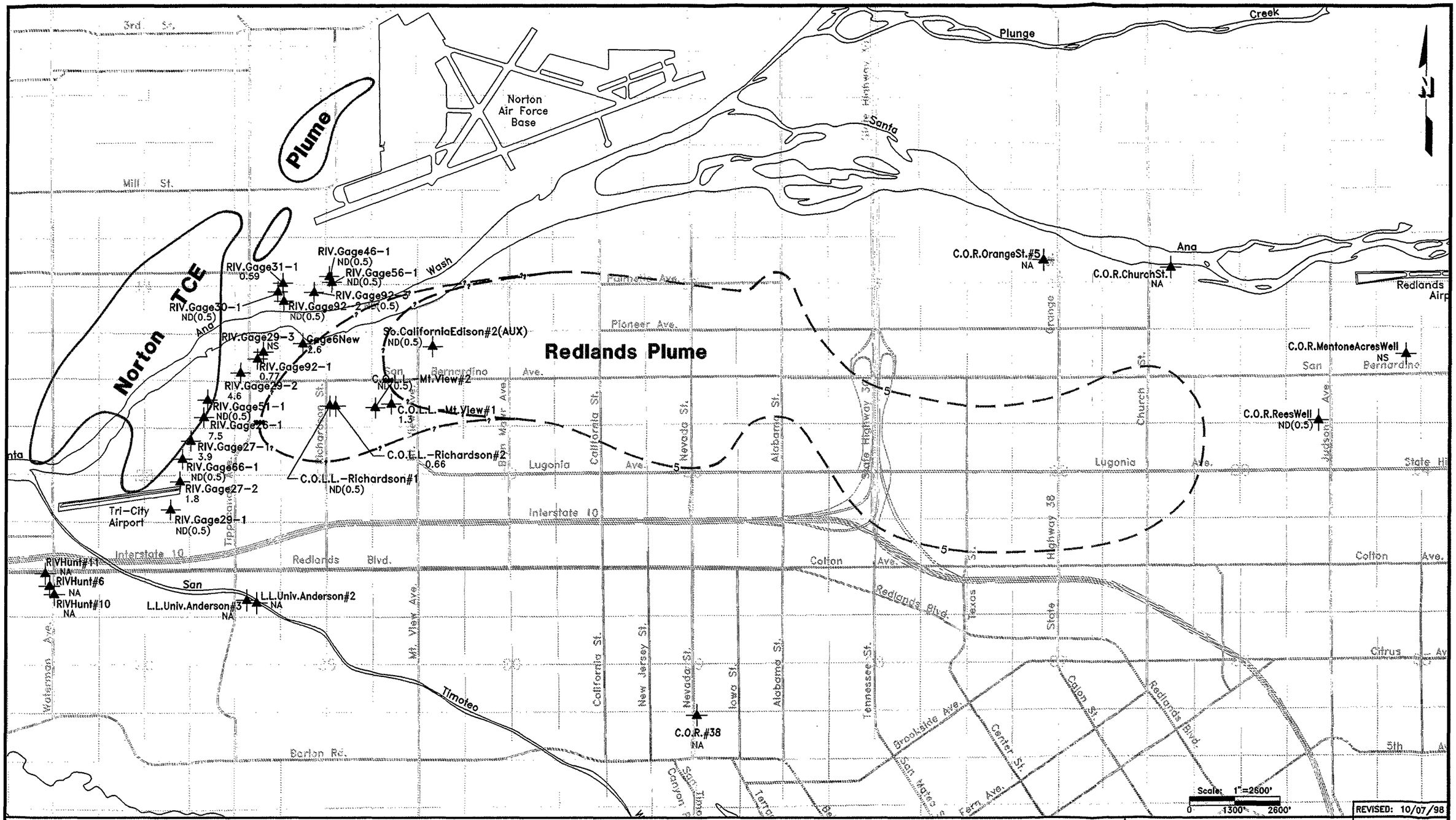
Notes:

* Well sometimes off-line between 7/1/98 - 9/30/98

All concentrations are micrograms per liter.

PAL = Provisional Action Level for perchlorate

# FIGURES




EXPLANATION

Wells Currently Sampled Under the Existing WSCP Sampling Program

1.8 TCE Results (µg/L)

--5-- Approximate TCE Plume Location 5 µg/L (1998 Interpretation of Redlands Plume)

—5— Approximate TCE Plume Location 5 µg/L (1998 Interpretation of Norton AFB Plume, by Norton)

—1998— Projected 5 µg/L TCE Contour in Hydrostratigraphic Unit 2

—1998— Projected 5 µg/L TCE Contour in Hydrostratigraphic Unit 4

ND(0.5) Not Detected at Indicated Detection Limit

NS Not Sampled

NA Not Analyzed

| | |
|---|---|
| ND(0.5) | C.O.L.L. Mountain View Blend at Lawton |
| ND(0.5) | C.O.L.L. Mountain View Blend at Timoteo |
| 0.56 | C.O.L.L. Richardson Blend |
| ND(0.5) | Riv. Iowa Booster (Waterman) |
| 1.3 | Riv. Gage Delivery (Gage) |
| 0.75 | Riv. 7th + Chicago (Reservoir) |
| 1.6 | Gage Arlington |

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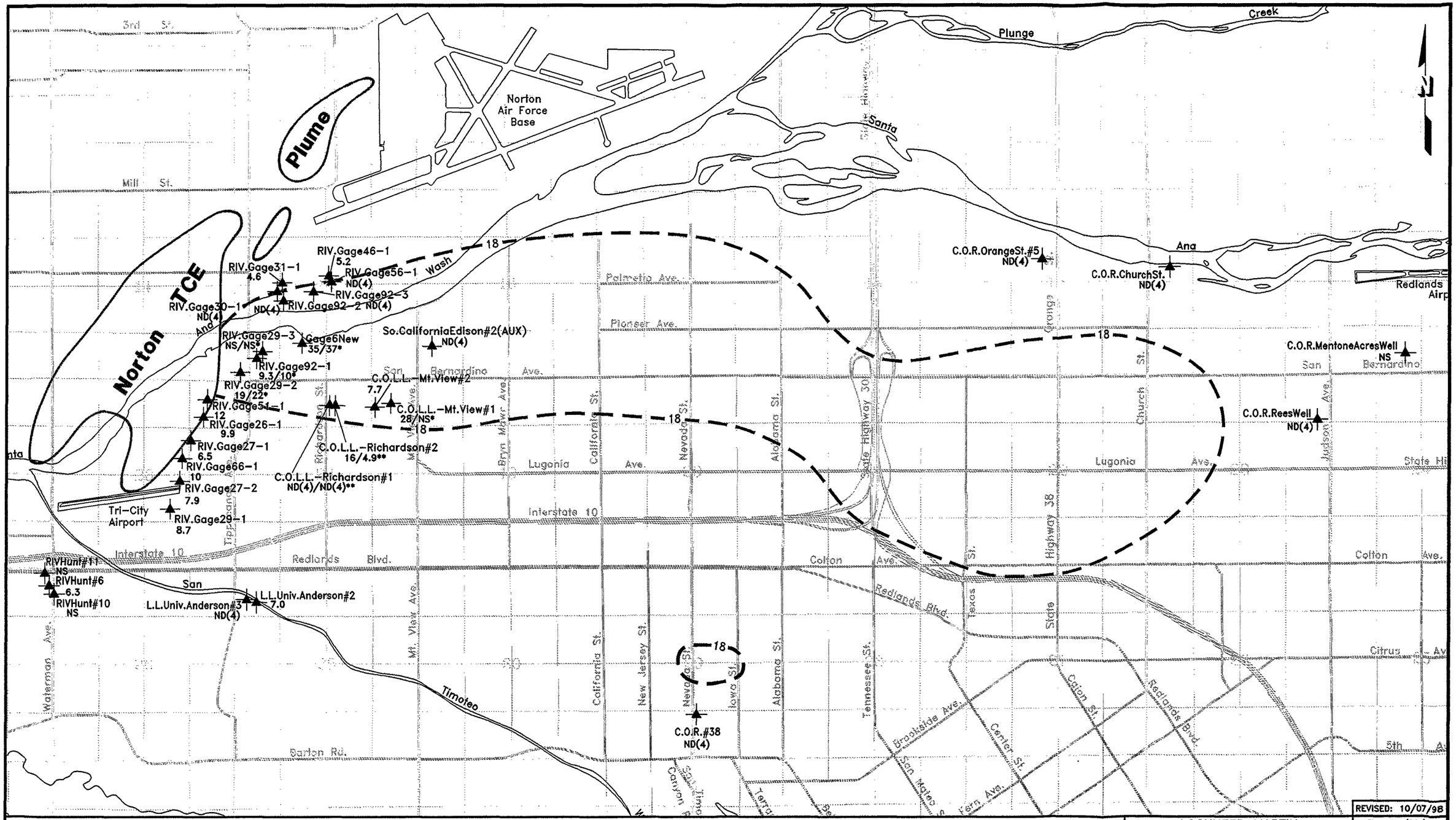
LOCKHEED MARTIN
REDLANDS, CALIFORNIA

**WSCP Production Well Sampling Program TCE Data Results September 1998**

HSI GEOTRANS
A TETRA TECH COMPANY

| | |
|---|---|
| REVISED: | 10/07/98 |
| DATE: | 09/29/98 |
| DESIGNED: | RJM |
| CHECKED: | RDL |
| APPROVED: | JCN |
| DRAWN: | HM |
| PROJ.: | N876-101 |

**Figure 1**




EXPLANATION

- Wells Currently Sampled Under the Existing WSCP Sampling Program
- —18— Approximate 18 µg/L Perchlorate Plume Location (1998 Interpretation)
- —5— Approximate TCE Plume Location 5 µg/L (1998 Interpretation of Norton AFB Plume, by Norton)

| | |
|---|---|
| 6.5 | Perchlorate (µg/L) Results |
| ND(4) | Not Detected at Indicated Detection Limit |
| NS | Not Sampled |
| * | Twice-Monthly Sampling Result |
| ** | Confirmation Sample Result |

| | |
|---|---|
| ND(4) | C.O.L.L. Mountain View Blend – Timoteo |
| 6.5 | C.O.L.L. Mountain View Blend – Lawton |
| 24/ND(4)** | C.O.L.L. Richardson Blend |
| ND(4) | Riv. Iowa Booster (Waterman) |
| 7.0 | Riv. Gage Delivery (Gage) |
| ND(4) | Riv. 7th + Chicago (Reservoir) |
| 6.0 | Gage Arlington |

Scale: 1" = 2600' (0, 1300', 2600')

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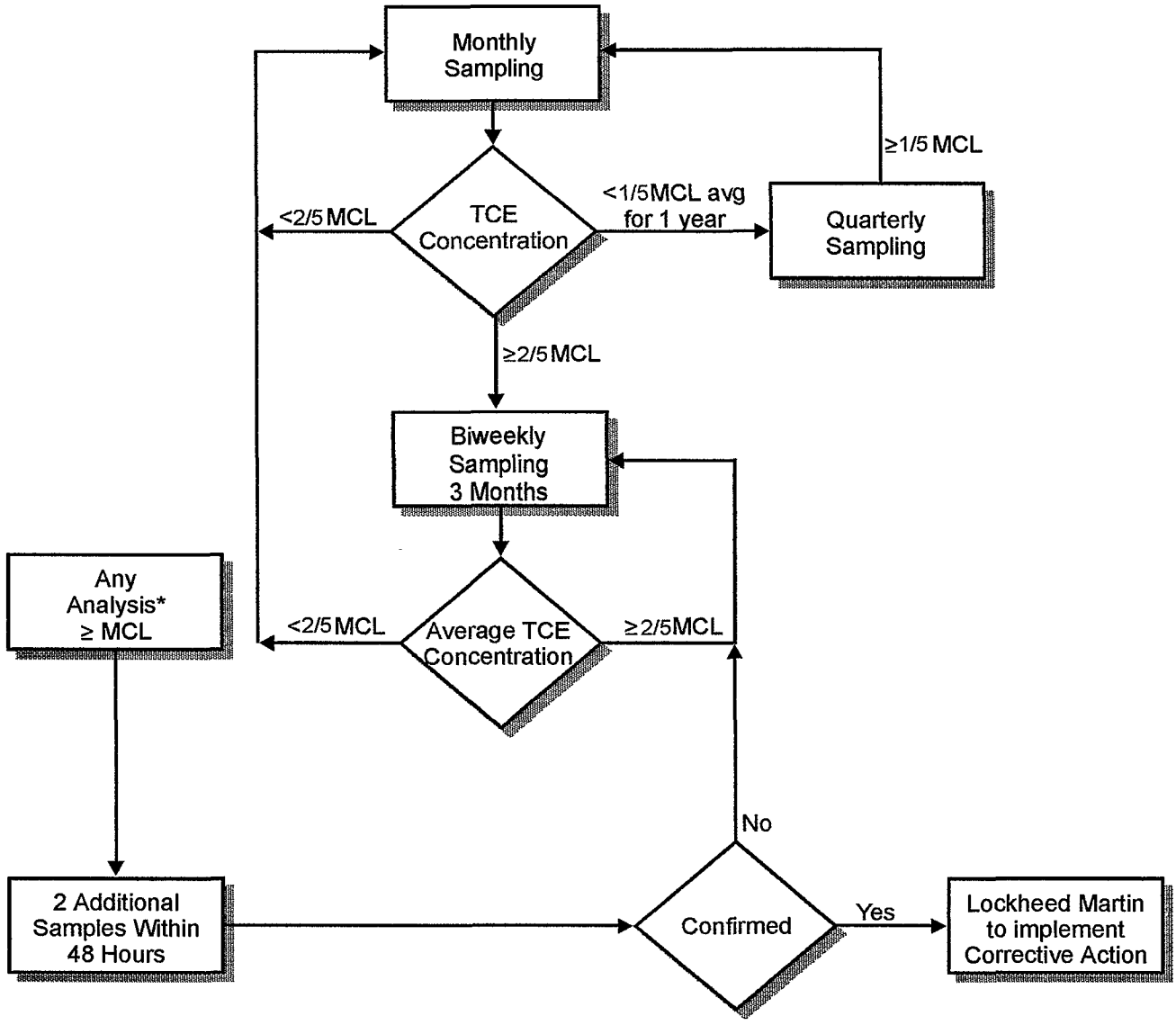
LOCKHEED MARTIN
REDLANDS, CALIFORNIA

**WSCP Production Well Sampling Program Perchlorate Data Results September 1998**

HSI GEOTRANS A TETRA TECH COMPANY

| | |
|---|---|
| REVISED: | 10/07/98 |
| DATE: | 09/29/98 |
| DESIGNED: | RJM |
| CHECKED: | RDL |
| APPROVED: | JCN |
| DRAWN: | HM |
| PROJ.: | N876-101 |

**Figure 2**




Footnote:

* If, at a specific well, blending is occuring to provide acceptable water for compounds other than TCE, then no corrective action may be necessary as long as the concentration of TCE is less than 5.0 ug/L in the finished water.

TCE MCL = 5 ug/l (California Regulations, Title 22, Division 4, Chapter 15, Section 64444)

| | |
|---|---|
| Lockheed Martin<br>Redlands, California | DATE: 8/28/97 |
| **Decision Matrix for Sampling of Production Wells for TCE from the Crafton-Redlands Plume** | DESIGNED: RPB<br>CHECKED: RJM<br>APPROVED: RJM<br>DRAWN: RPB<br>PROJ.: N876-101 |
| HSI GEOTRANS A TETRA TECH COMPANY | Figure 3 |

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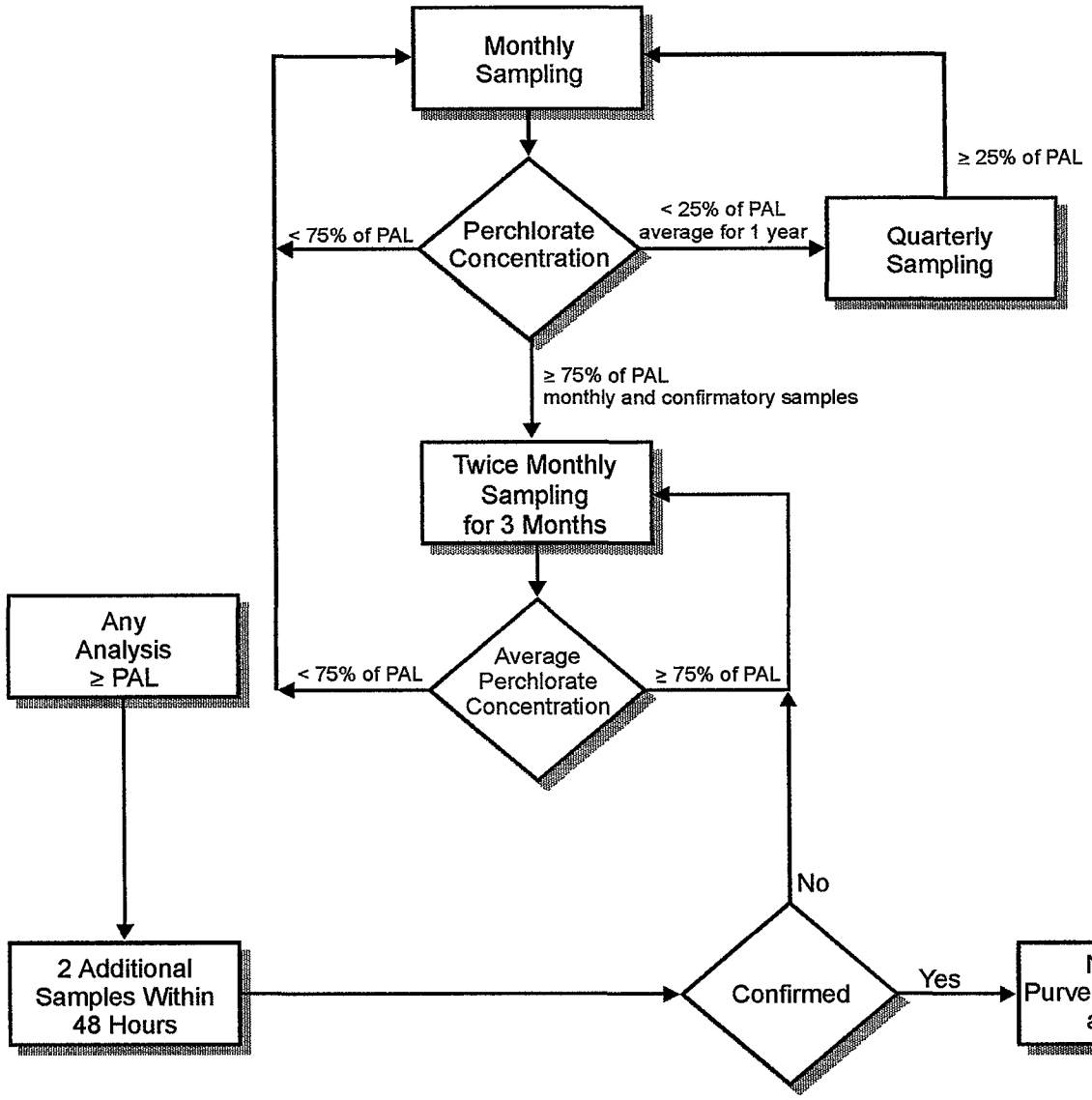


Footnote:

Perchlorate Provisional Action Level (PAL) = 18 ug/L (California Department of Health Services, May 1997)

| | |
|---|---|
| | REVISED: 8/12/97 |
| Lockheed Martin<br>Redlands, California | DATE: 7/22/97 |
| | DESIGNED: RPB |
| **Decision Matrix for Sampling Production Wells for Perchlorate** | CHECKED: RJM |
| | APPROVED: RJM |
| | DRAWN: RPB |
| | PROJ.: N876-101 |
| HSI GEOTRANS<br>A TETRA TECH COMPANY | **Figure 4** |

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# ATTACHMENT A

## GEOLIS FIELD FORMS

## ATTACHMENT A

## GEOLIS FIELD FORMS
(Available Upon Request)

# ATTACHMENT B

## CHAIN-OF-CUSTODY RECORDS AND LABORATORY DATA SHEETS

## ATTACHMENT B

## CHAIN-OF-CUSTODY RECORDS
## AND
## LABORATORY DATA SHEETS
(Available Upon Request)

# ATTACHMENT C

## LEVEL III
## QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION

## ATTACHMENT C

## LEVEL III
## QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION
(Available Upon Request)